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THE LEAF-COLLECTOR'S AND-BOOK AND HERBARIUM

AID IN THE PRESERVATION AND IN THE CLASSIFICATION OF SPECIMEN LEAVES OF THE TREES OF NORTHEASTERN AMERICA

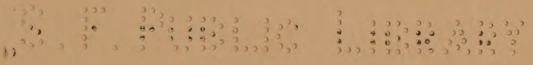
BY

CHARLES S. NEWHALL

AUTHOR OF "THE TREES OF NORTHEASTERN AMERICA," "THE SHRUBS OF NORTHEASTERN AMERICA," ETC.

FIFTH IMPRESSION

ILLUSTRATED



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GUMMED PAPER

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PREFACE.

The leaves described and pictured in the following pages represent all the native trees, and the most important introduced and naturalized trees of Northeastern America,*—with a few exceptions.

Those species are considered trees (in distinction from shrubs) which, as a rule, spring from the ground with a single branching trunk.†

How to use the book will be readily understood by consulting the following directions.

* The names of introduced and naturalized species are enclosed in brackets.

† "Trees of Northeastern America," page 4.

DIRECTIONS.

1. *How to find the names of specimens.*—Compare any ven specimen, first with the descriptions in the "Guide," n pages xiv and xv, and then with the illustrations to hich the "Guide" directs.*

2. *How to mount specimens.*—When the specimens ıve been pressed and *thoroughly dried*, and all their thick ems removed or pared, they should be fastened in their aces opposite the corresponding illustrations, with strips gummed paper an eighth of an inch or less in width.†

The compound leaves and the simple leaves, when they e larger than the allotted space, should be represented sections of the leaf.

3. *How to preserve specimens.*—If the collection is at-cked by insects, each leaf should be brushed lightly with *saturated solution of corrosive sublimate and alcohol, creased by two thirds more of alcohol.*

4. *Notes.*—Interest and value will be added to the llection if full memoranda are kept of dates, localities, ıme of the finder, incidents, characteristics of the tree, etc.

5. It should be remembered that leaves from vigorous ung sprouts are not usually the best specimens. It is ldom that two leaves, even upon the same mature branch, actly agree, but they follow the type, while often the unger growth varies from it.‡

* If fuller descriptions and comments are desired, they can be found in the author's rk on "The Trees of Northeastern America."

† A supply of gummed paper will be found at the end of the volume.

‡ "The Trees of Northeastern America," page 4.

LIST OF GENERA.

A—*I*

	FIGURE
nólia	1–3
ina	4
is	5
a	6
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afras	8

II

	9
	10–11
us	12–14
s	15
ègus	16–19
lànchier	20
dèndrum	21
us	22–23
s	24
us	25
ssonètia	25
nus	26
la	27–31
ya	32
lnus	33
ánea	34
s	35
	36–43
lus	44–51

III (a)

	FIGURE
Liriodèndron	52
Quercus	53–66

(b)

Liquidàmber	67

B—*I*

Cornus	68–69
Chionànthus	70
Catàlpa	71

II

Vibùrnum	72–73

III

Acer	74–78

C

Pinus	79–85
Pìcea	86–88
Tsùga	89
Àbies	90

	FIGURE
Larix	91
Chamæcỳparis	92
Thùya	93
Junìperus	94

D—*I*

Ailànthus	95
Robìnia	96
Gymnòcladus	97
Gledìtschia	98

II

Rhus	99–100
Pyrus	101
Juglans	102–103
Hicòria	104–108

E—*I*—*II*

Negùndo	109
Fràxinus	110–114

F

Æsculus	115–116

GUIDE.

Leaves, simple:*

- alternate†
  - edge entire. Go to A—*I*
  - " toothed. " A—*II*
  - " lobed
    - Lobes, entire. Go to A—*III (a*
    - Lobes, toothed. " A—*III (b*
- opposite
  - edge entire. Go to B—*I*
  - " toothed. " B—*II*
  - " lobed
    - Lobes, entire. Go to B—*III (a*
    - Lobes, toothed. " B—*III (b*

Indeterminate. Go to C—*I*

Leaves, compound:

- feather-shaped‡‡
  - alternate, edge
    - entire. Go to D—*I*
    - toothed. " D—*I*
  - opposite, edge
    - entire. Go to E—*I*
    - toothed. " E—*I*
- hand-shaped§§
  - opposite, edge toothed. Go to F—*I*

* The leaflets of a compound leaf can be distinguished from a simple leaf by t absence of leaf-buds from the base of their stems.

† Referring to the arrangement of the leaves on the branch.

‡ *E. g.*, as in the hickories, sumachs, etc.

§ *E. g.*, as in the horse-chestnut, etc.

GUIDE *(Continued).*

NOTE.—Names in *italics* are given also under another division.

LEAVES—SIMPLE

A *(alternate)*

I (edge entire)

	FIGURE
Magnolias	1–3
Papaw	4
Judas tree	5
Gum, sour	6
Persimmon	7
Sassafras	8
Oak, willow	65
Dogwood, alt.-leaved	69
Willow, long-beaked	39

II (edge toothed)

Basswoods	9
Hollies	10–11
Cherries	12–13
Plum	14
Crab-apple	15
Thorns	16–19
Chad-bush	20
Sorrel tree	21
Elms	22–23
Hackberry	24
Mulberry	25
Buttonwood	26
Birches	27–31
Hornbeam, Hop	32
Hornbeam	33
Chestnut	34
Beech	35
Willows	36–43
Poplars	44–51
Oaks, chestnut	57

III (edge lobed)

(a) (lobes entire)

	FIGURE
Tulip tree	52
Oaks	53–66
Sassafras	8
Buttonwood	26

(b) (lobes toothed)

Gum, sweet	67
Poplar, silver-leaf	51
Mulberry	25
Oaks	53–66

B *(opposite)*

I (edge entire)

Dogwood, flowering	68–69
Fringe tree	70
Catalpa	71

II (edge toothed)

Black haw	72
Viburnum, sweet	73

III (edge lobed)

(a) (lobes entire)

(b) (lobes toothed)

Maples	74–78

C *(indeterminate)*

I

Pines, cedars, spruce, etc.	79–94

LEAVES—COMPOUND

1 feather-shaped

D *(edge alternate)*

I (entire)

	FIGURE
Ailanthus	95
Locusts	96
Coffee-tree, Kentucky	97
Locust, honey	98
Sumach, poison	100

II (edge toothed)

Sumach, stag-horn	99
Ash, mountain	101
Walnut, black	102
Butternut	103
Hickories	104–108
Locust, honey	98

E *(opposite)*

I (edge entire)

Ash, red and white	110–111

II (edge toothed)

Ash-leaved maple	109
Ash, black, blue, green, red, and white	102 110–114

2 hand-shaped

F *(opposite)*

I (edge toothed)

Buckeyes	115–116

TREES WITH SIMPLE LEAVES

LEAVES ALTERNATE

(EDGE ENTIRE)

A I

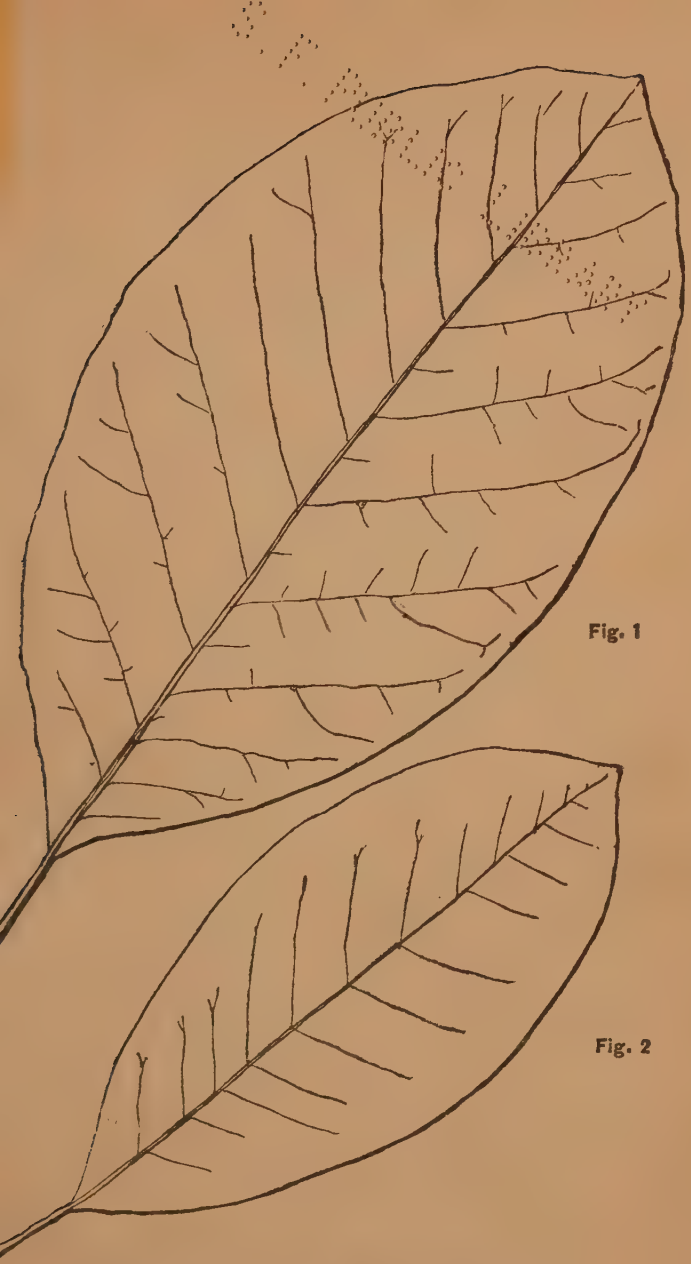


Fig. 1.—Cucumber Tree. (M. acuminàta, L.)
Fig. 2.—Sweet Bay. (M. glauca, L.)
NATURAL SIZE.

Fig. 3.—Umbrella Tree. (*I. tripètala*, L.)
ONE THIRD NATURAL SIZE.

Fig. 4.—Papaw. A. triloba (L.), Dunal.
AF, NATURAL SIZE. FRUIT, TWO THIRDS NATURAL SIZE.

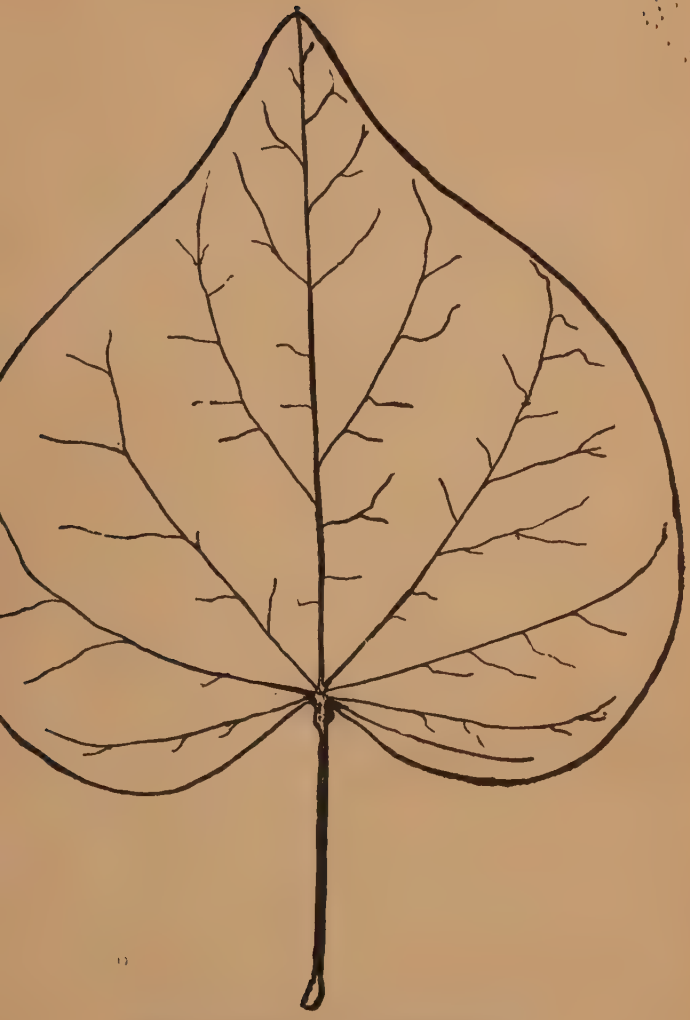


Fig. 5.—Red Bud. (C. Canadènsis, L.)
NATURAL SIZE.

Fig. 6.—Sour Gum. (N. sylvàtica, Marsh.)
NATURAL SIZE.

Fig. 7.—Persimmon. (D. Virginiàna, L.)
NATURAL SIZE.

Fig. 8.—Sassafras. (S. officinàle, Nees.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

LEAVES ALTERNATE

CONTINUED

(EDGE TOOTHED)

A II

Fig. 9.—Basswood. (T. Americàna, L.)
NATURAL SIZE.

Fig. 10

Fig. 11

Fig. 10.—American Holly. (I. opàca, Ait.)
Fig. 11.—I. monticola.
NATURAL SIZE.

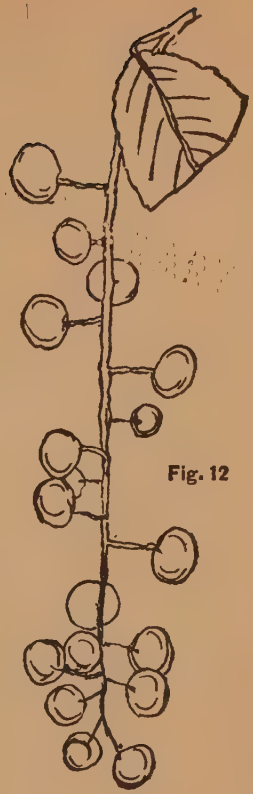


Fig. 12

Fig. 13

Fig. 12.—Wild Black Cherry. (P. serótina, Ehr.)
Fig. 13.—Wild Red Cherry. (P. Pennsylvánica, L).
NATURAL SIZE.

Fig. 14.—Wild Plum. (P. Americàna, Marsh.)
NATURAL SIZE.

Fig. 15.—Crab-Apple. (P. coronària, L.)
NATURAL SIZE.

Fig. 16

Fig. 17

Fig. 16.—White Thorn and Fruit. (C. coccinea, L.)
Fig. 17.—Black Thorn. (C. tomentòsa, L.)
NATURAL SIZE.

Fig. 18.—Common Thorn. (C. punctàta, Jac.)
NATURAL SIZE.

Fig. 19.—Cockspur Thorn. (C. crus-galli, L.)
NATURAL SIZE.

Fig. 20.—Shad-bush. A. Canadènsis (L.), Medik.
NATURAL SIZE

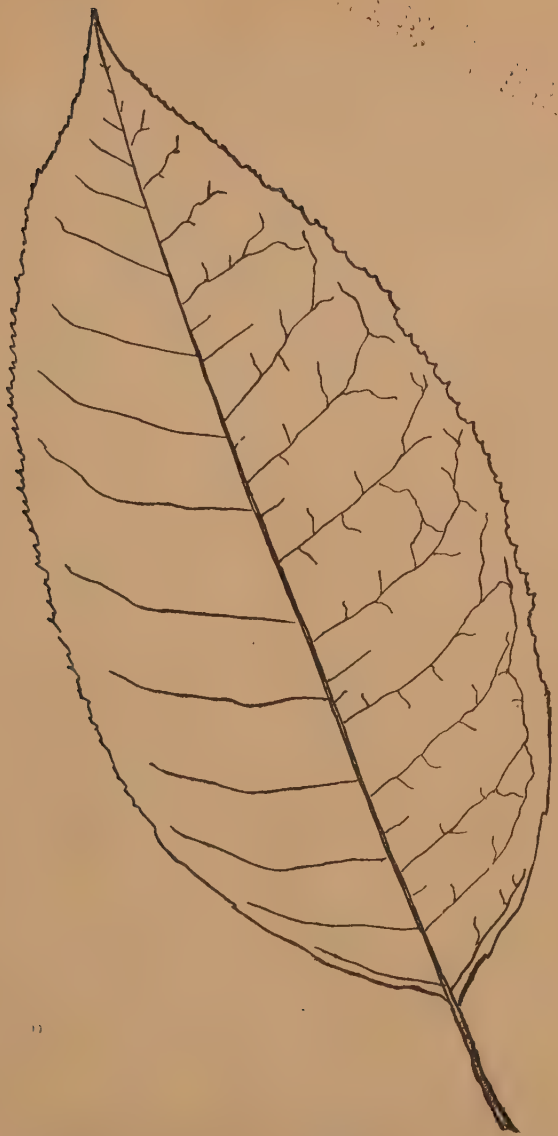


Fig. 21.—Sorrel Tree. O. arbòreum (L.), D. C.
NATURAL SIZE.

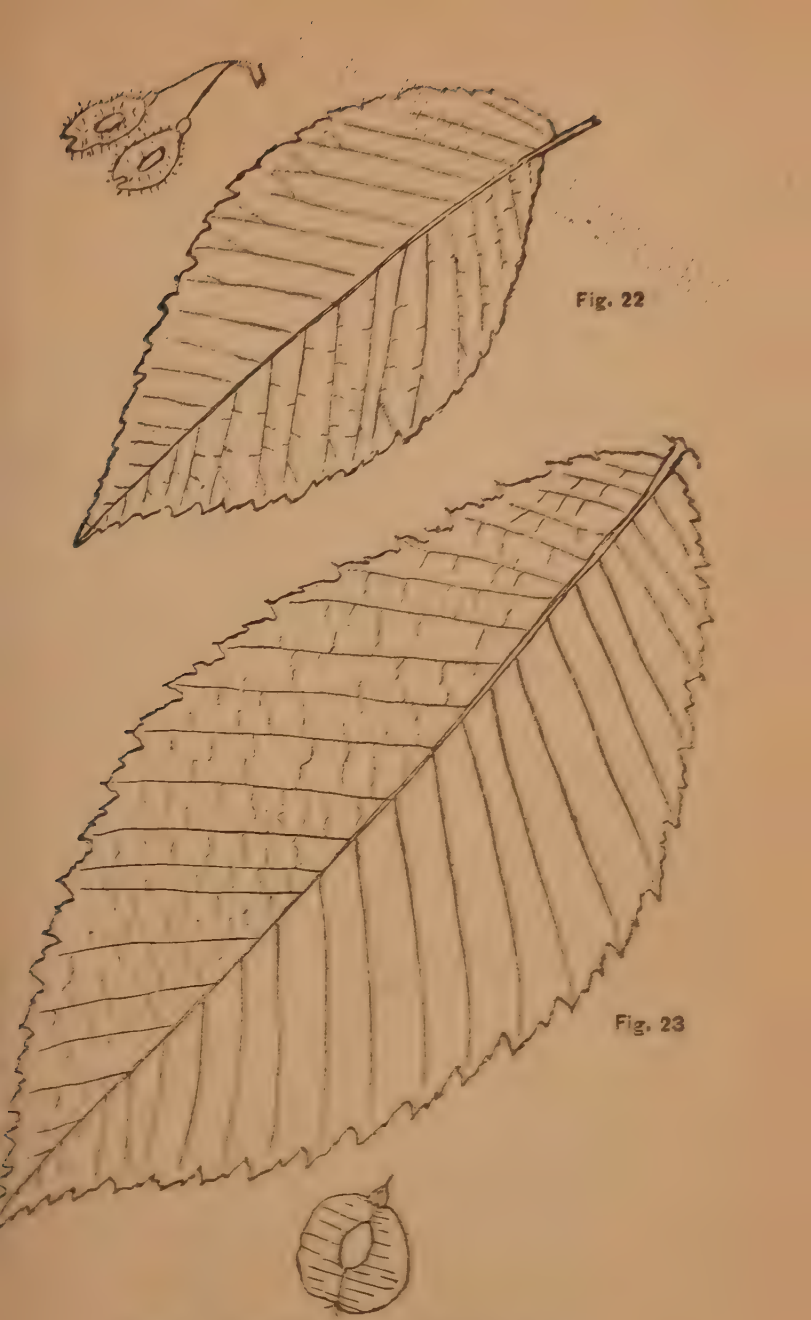


Fig. 22

Fig. 23

Fig. 22.—White Elm. (U. Americàna, L.)
Fig. 23.—Slippery Elm. (U. fulva, Michaux.)
NATURAL SIZE

Fig. 24.—Hackberry. (C. occidentàlis, L.)
NATURAL SIZE.

Fig. 25.—Red Mulberry. M. rubra, L.
NATURAL SIZE.

Fig. 26.—Buttonwood. (P. occidentàlis, L.)
NATURAL SIZE.

Fig. 27

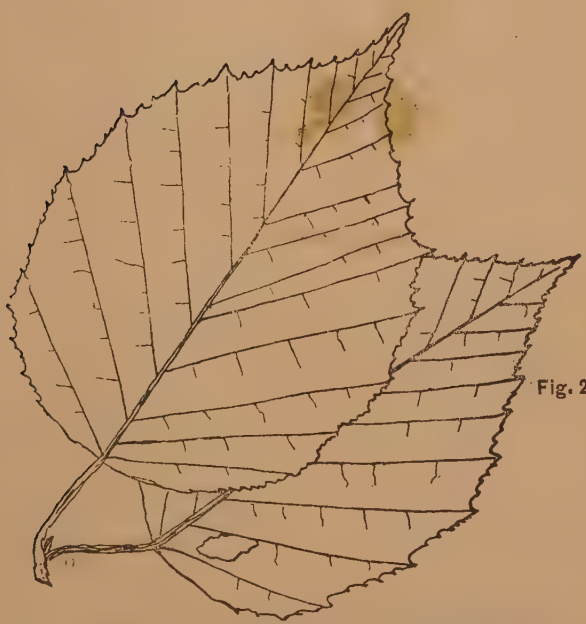


Fig. 28

Fig. 27.—White Birch. (B. populifòlia, Marsh.)
Fig. 28.—Paper Birch. (B. papyrifera, Marsh.)
NATURAL SIZE.

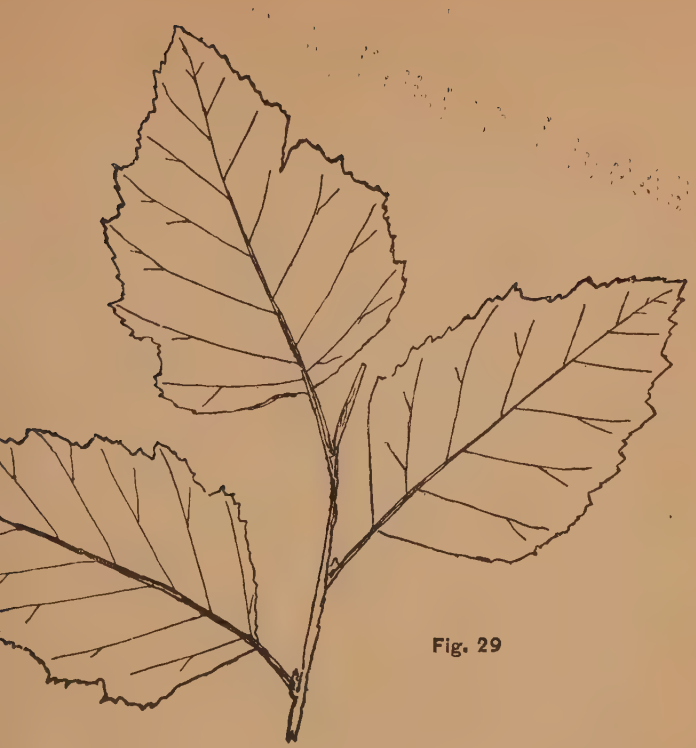


Fig. 29

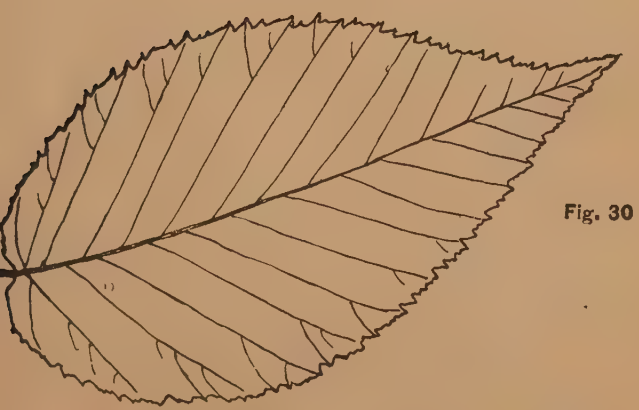


Fig. 30

Fig. 29.—Red Birch. (B. nigra, L.)
Fig. 30.—Yellow Birch. (B. lùtea, Michaux, f.)
NATURAL SIZE.

Fig. 31.—Sweet Birch. (B. lenta, L.)
NATURAL SIZE.

Fig. 32.—Hop-Hornbeam. O. Virginiàna (Mill), Willd.

a. Leaves. *b*. Fruit.

NATURAL SIZE.

Fig. 33.—Hornbeam. (C. Caroliniàna, Walt.)

a. Fruit scales. *b*. Leaves.

NATURAL SIZE.

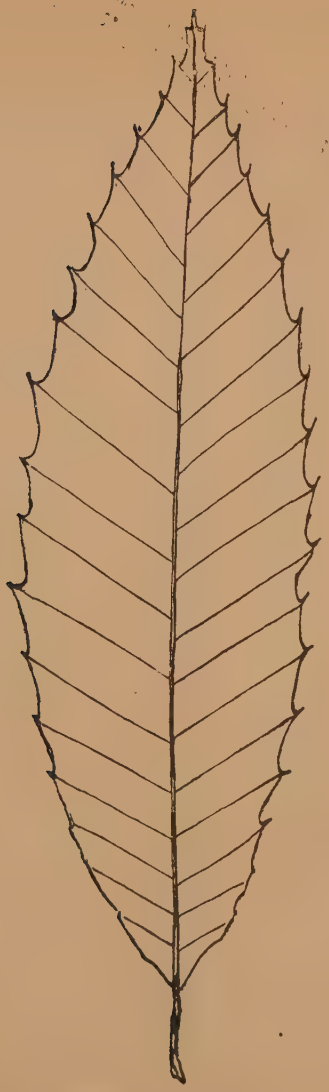


Fig. 34.—Chestnut. C. Sativa (L.), var. Americàna (Michaux), Sarg.
NATURAL SIZE.

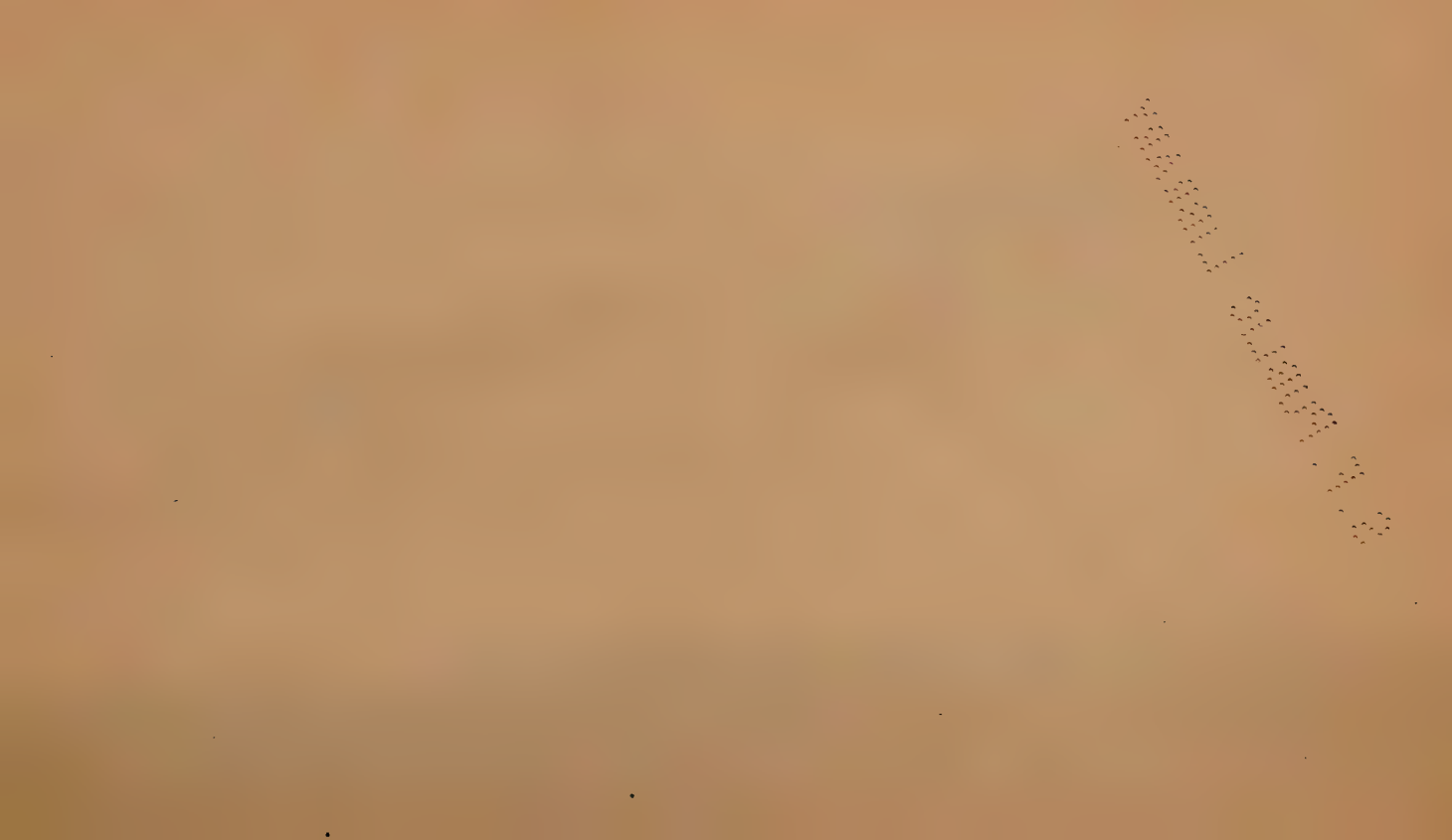


Fig. 35.—Beech. (F. ferruginea, Ait.)
NATURAL SIZE.

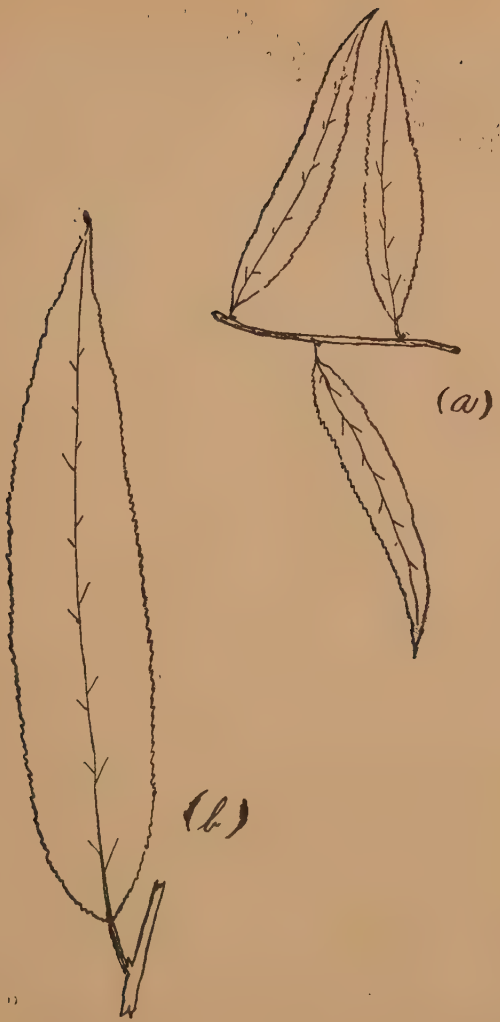


Fig. 36.—Black Willow. (S. nigra, Marsh.)

a. Commonest form. *b*. Large form.

NATURAL SIZE.

Fig. 37.—Scythe-leaved Willow. (S. n., var. falcàta, Torr.)
a. Stipules. *b*. Leaves.
NATURAL SIZE.

Fig. 38.—Shining Willow. (S. lùcida, Muhl.)
NATURAL SIZE.

Fig. 39.—Long-beaked Willow. (S. rostràta, Richards.)
NATURAL SIZE.

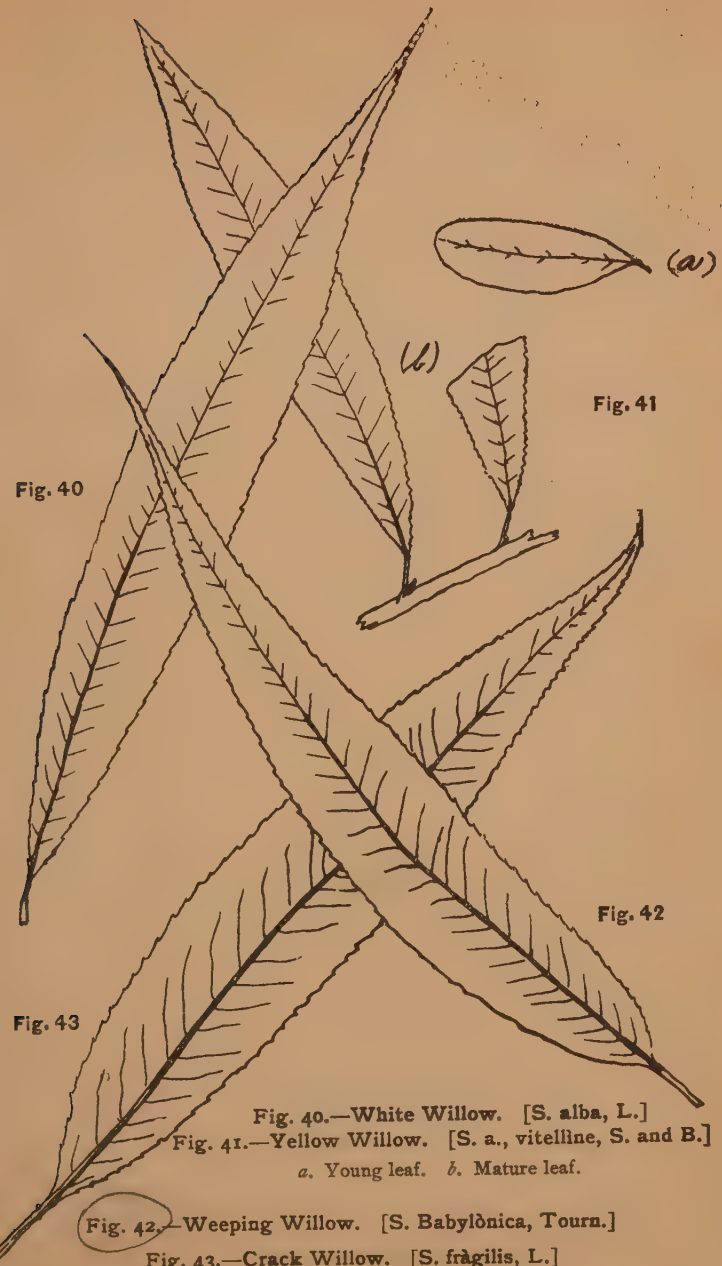


Fig. 40.—White Willow. [S. alba, L.]

Fig. 41.—Yellow Willow. [S. a., vitelline, S. and B.]

a. Young leaf. *b*. Mature leaf.

Fig. 42.—Weeping Willow. [S. Babylònica, Tourn.]

Fig. 43.—Crack Willow. [S. fràgilis, L.]

NATURAL SIZE.

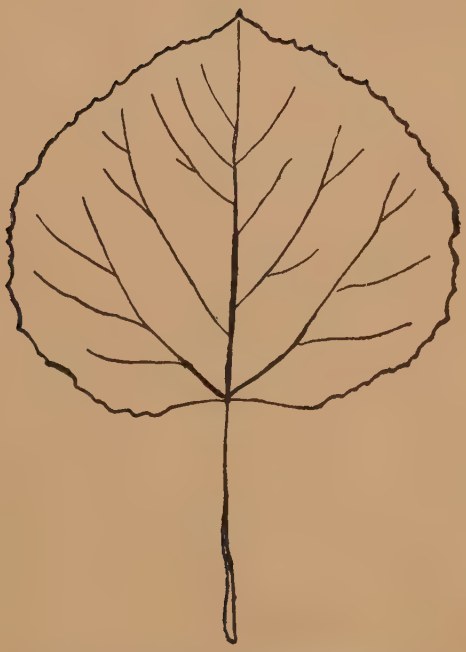


Fig. 44.—Aspen. (P. tremuloides, Michx.)
NATURAL SIZE.

Fig. 45.—Large Toothed Aspen. (P. grandidentàta, Michx.)
NATURAL SIZE.

Fig. 46.—Downy-leaved Poplar. (P. heterophylla, L.)
NATURAL SIZE.

Fig. 47.—Cottonwood. (P. monillfera, Ait.)
NATURAL SIZE.

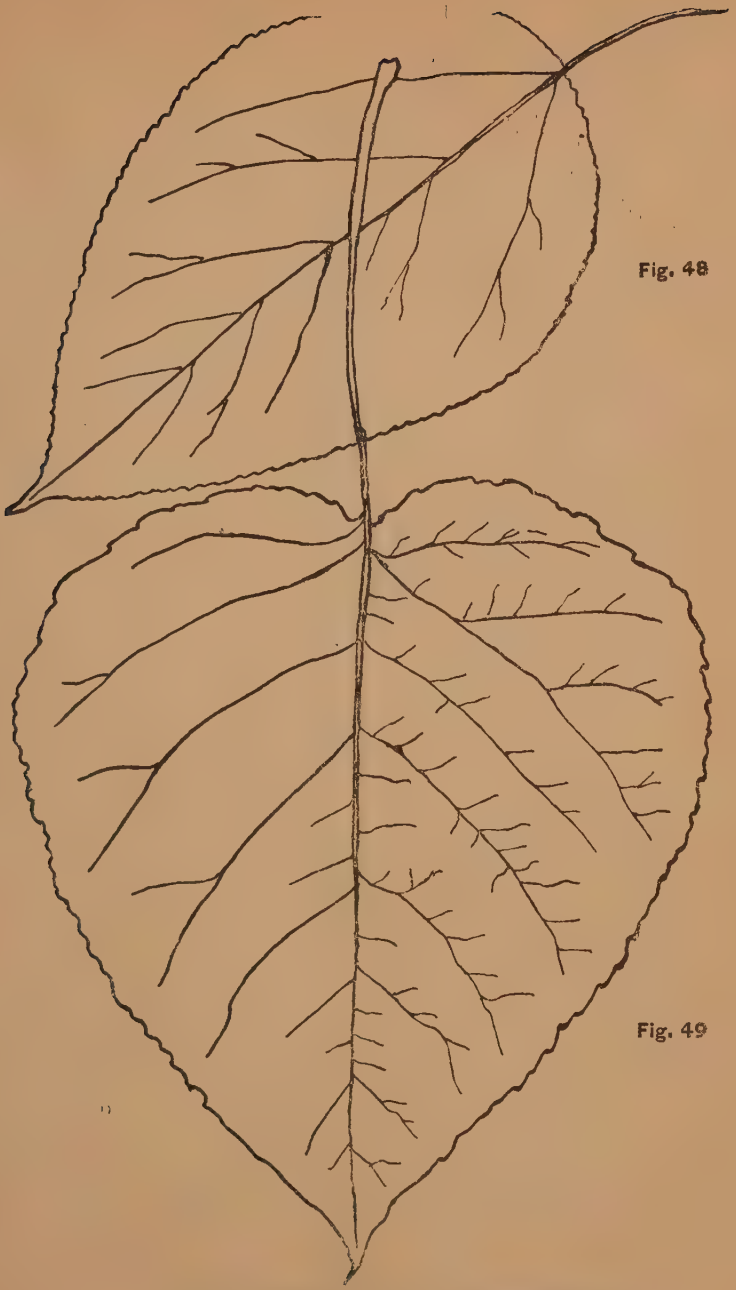


Fig. 48

Fig. 49

Fig. 48.—Balsam Poplar. (P. balsamifera, L.)
Fig. 49.—Balm of Gilead. P. b. càndicans (Ait.), Gray.
NATURAL SIZE.

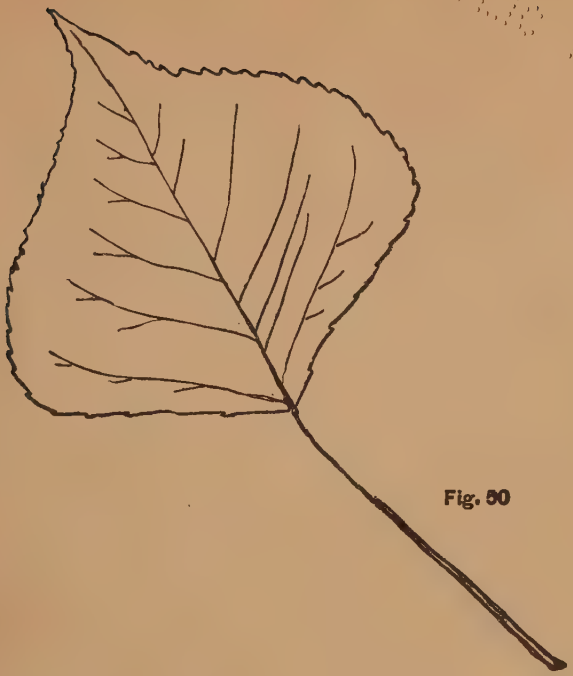


Fig. 50

Fig. 51

Fig. 50.—Lombardy Poplar. [P. dilatàta, Ait.]
Fig. 51.—Silver-Leaf Poplar. [P. alba, L.]
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

LEAVES ALTERNATE

CONTINUED

(EDGE LOBED)

A III

(a) and *(b)*

Fig. 52.—Tulip Tree. (L., tulipifera, L.)
NATURAL SIZE.

Fig. 53.—White Oak. (Q. alba, L.)
LEAVES AND FRUIT REDUCED ONE FOURTH.

Fig. 54.—Post Oak. Q. minor (Marsh), Sarg.
LEAVES AND FRUIT REDUCED ONE FOURTH.

Fig. 55.—Burr Oak. (Q. macrocàrpa, Michx.)
LEAVES AND FRUIT REDUCED ONE FOURTH.

Fig. 56.—Swamp White Oak. (Q. bicolor, Willd.)
NATURAL SIZE.

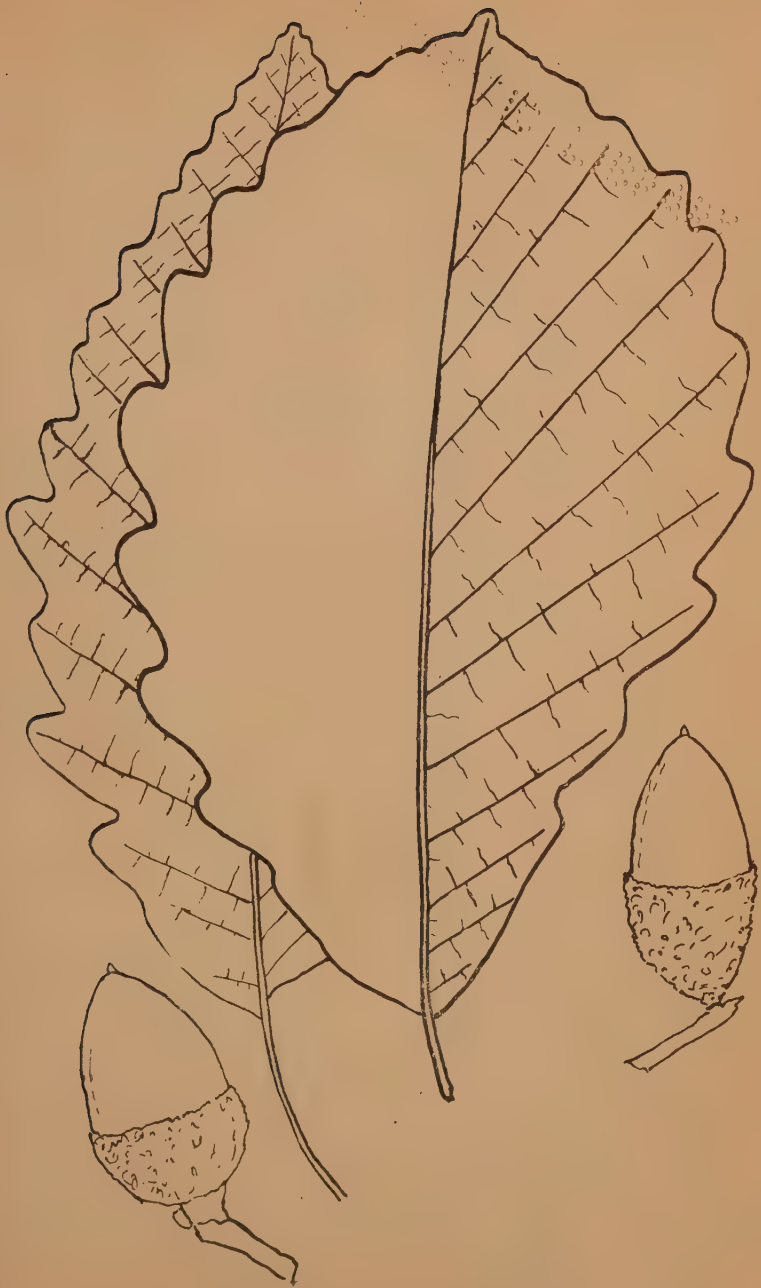


Fig. 57.—Chestnut Oak. (Q. prinus, L.)
NATURAL SIZE.

Fig. 58.—Yellow Chestnut Oak. Q. (Muhl.), Engel.
NATURAL SIZE.

Fig. 59.—Black Jack. (Q. nigra, L.)
NATURAL SIZE.

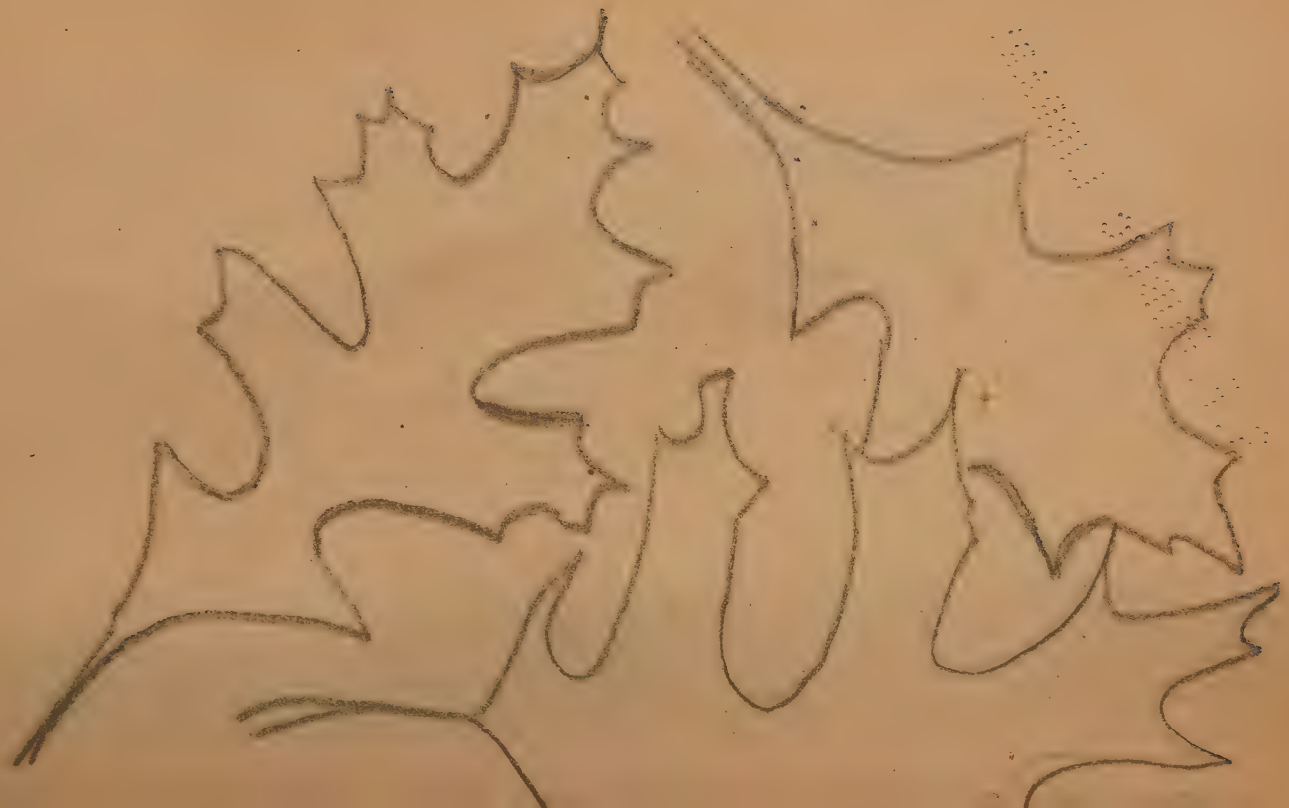
Fig. 60.—Spanish Oak. (Q. cuneàta, Wang.)
NATURAL SIZE.

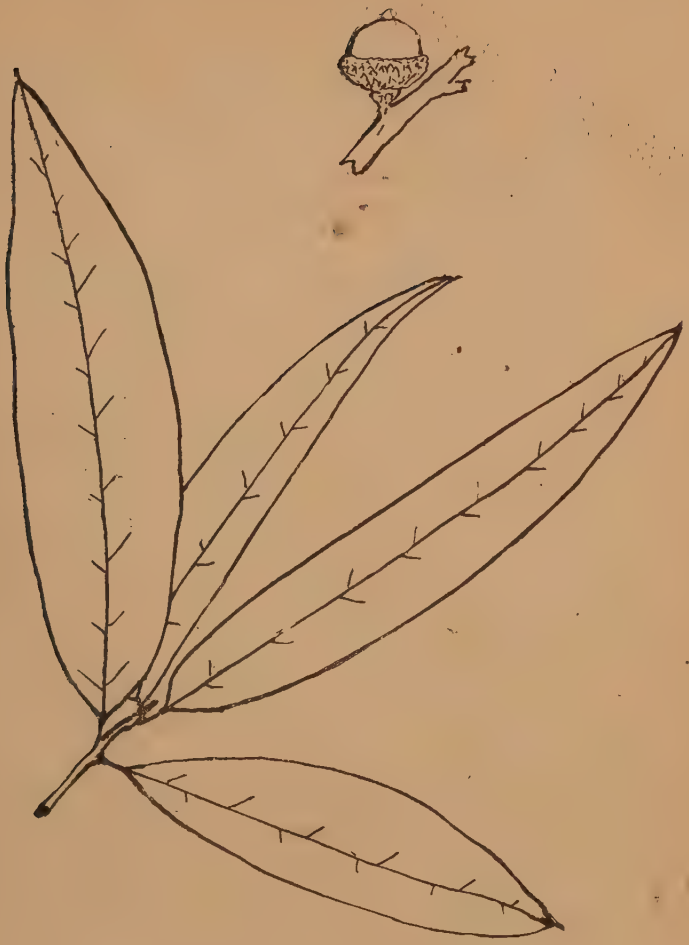
Fig. 61.—Scarlet Oak. (Q. coccinea, Wang.)
NATURAL SIZE.

Fig. 62, *a* and *b*.—Black Oak. (Q. c., tinctòria, Gray.)
FRUIT AND LEAVES REDUCED ONE FOURTH.

Fig. 63.—Red Oak. (Q. rubra, L.)
NATURAL SIZE.

Fig. 64.—Pin Oak. (Q. palùstris, D. Roi.)
NATURAL SIZE.





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NATURAL SIZE.

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NATURAL SIZE.

Fig. 67.—Sweet Gum. (L. styraciflua, L.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

CONTINUED

LEAVES OPPOSITE

(EDGE ENTIRE)

B I

Fig. 68.—Flowering Dogwood. (C. flòrida, L.)
NATURAL SIZE.

Fig. 69.—Alternate-leaved Dogwood. (C. alternifòlia, L. f.)
NATURAL SIZE.

Fig. 70.—Fringe Tree. (C. Virginica, L.)
NATURAL SIZE.

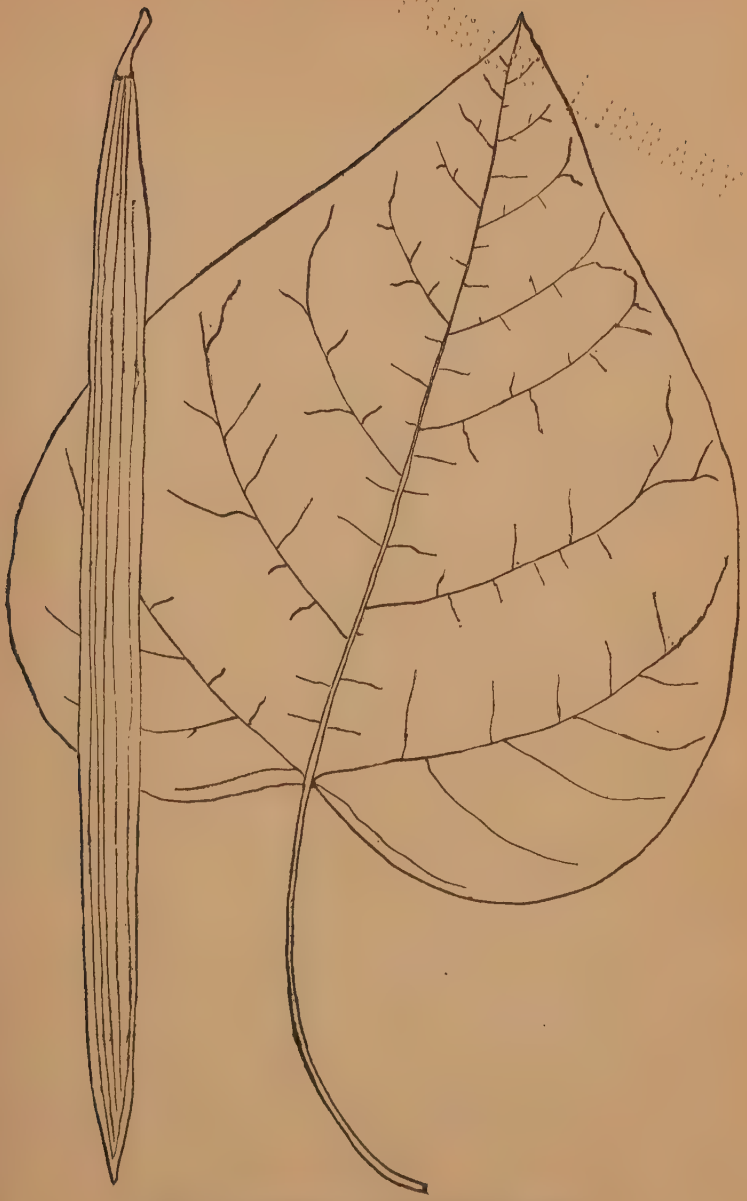

Fig. 71.—Catalpa. (C. bignonoides, Walt.)
LEAF AND FRUIT REDUCED ONE THIRD.

TREES WITH SIMPLE LEAVES

LEAVES OPPOSITE

CONTINUED

(EDGE TOOTHED)

B II

Fig. 72

Fig. 73

Fig. 72.—Black Haw. (V. prunifòlium, L.)
Fig. 73.—Sweet Vibùrnum. (V. lentàgo, L.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

LEAVES OPPOSITE

CONTINUED

(EDGE LOBED)

B III

Fig. 74.—Striped Maple. (A. Pennsylvànicum, L.)
NATURAL SIZE.

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NATURAL SIZE.

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NATURAL SIZE.

Fig. 77.—Silver-Leaf Maple. (A. saccharinum, L.)
NATURAL SIZE.

Fig. 78.—Red Maple. (A. rubrum, L.)
NATURAL SIZE.

TREES WITH SIMPLE LEAVES

CONTINUED

LEAVES INDETERMINATE

C I

Fig. 79

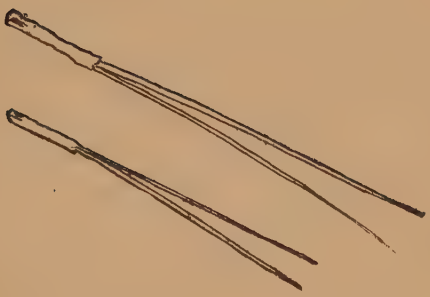

Fig. 80

Fig. 81

Fig. 82

Fig. 79.—Gray Pine. (P. Banksiàna, Lam.)
Fig. 80.—Scrub Pine. (P. Virginiàna, Mill.)
Fig. 81.—Table Mountain Pine. (P. pungens, Michx.)
Fig. 82.—Red Pine. (P. resinòsa. Ait.)

NATURAL SIZE.

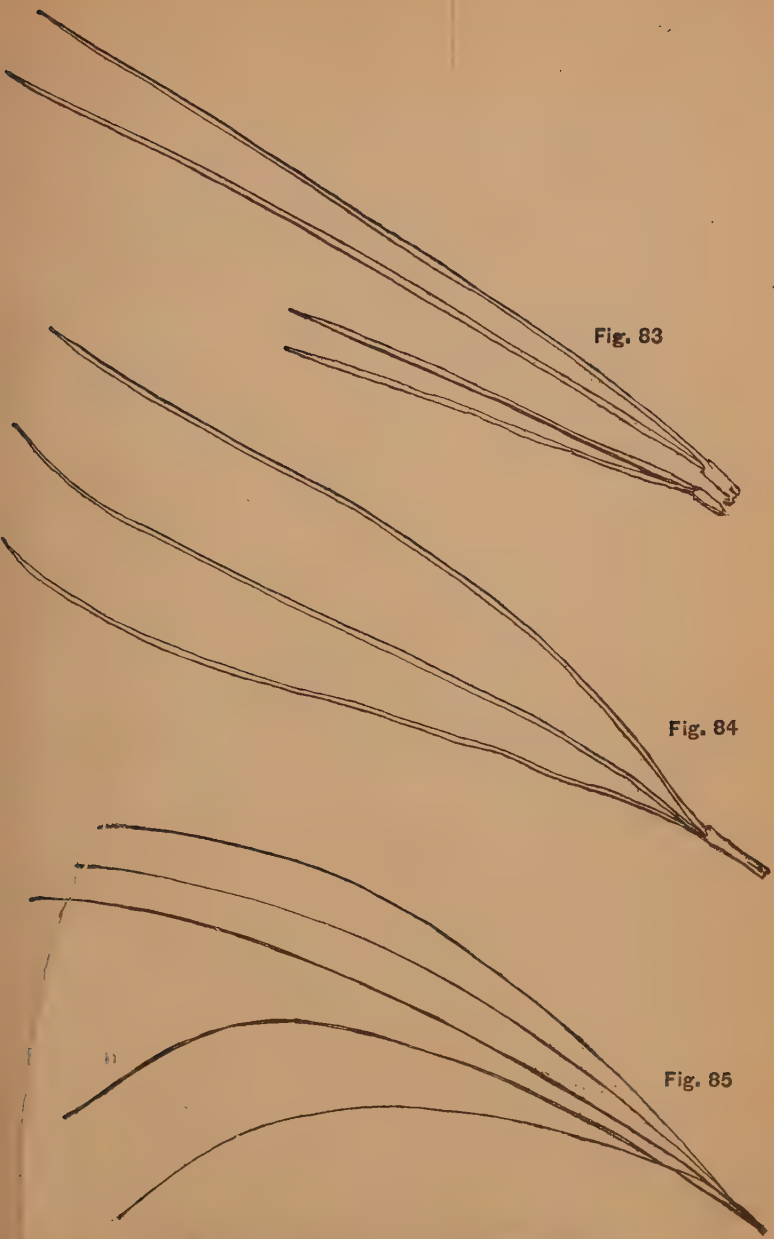

Fig. 83.—Yellow Pine. (P. ecpinàta, Mill.)
Fig. 84.—Pitch Pine. (P. rigida, Mill.)
Fig. 85.—White Pine. (P. Strobus, L.)

NATURAL SIZE.

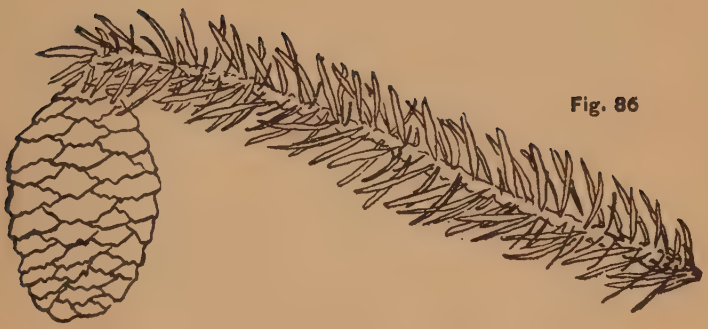

Fig. 86

Fig. 87

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Fig. 87.—White Spruce. P. Canadènsis (Mill), B. S. P.
NATURAL SIZE.

Fig. 88.—Norway Spruce. [P. excèlsa.]
NATURAL SIZE.

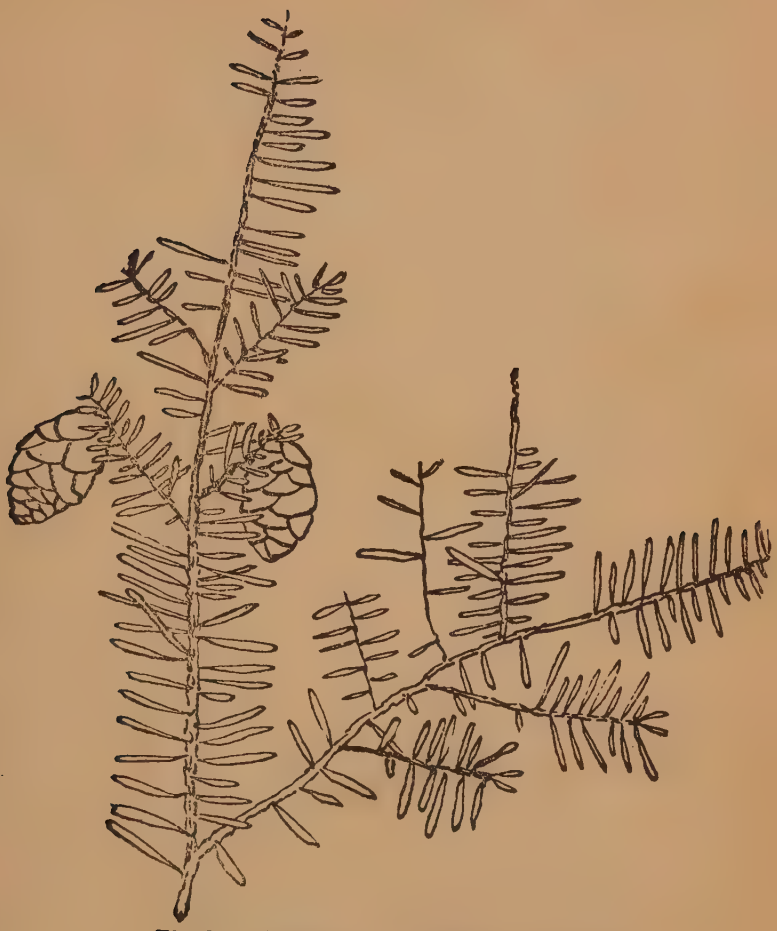
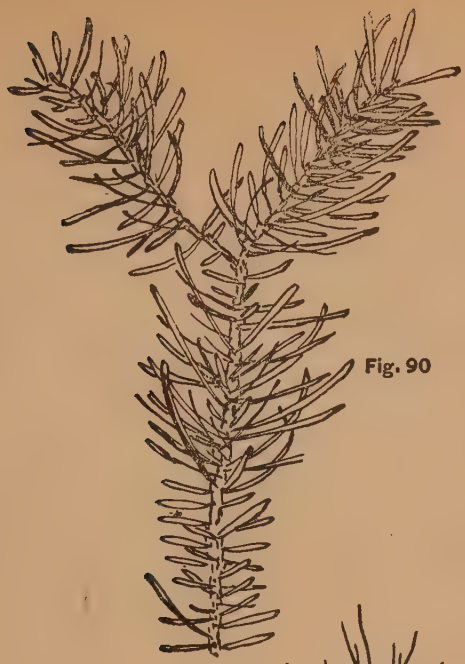


Fig. 89.—Hemlock. T. Canadènsis (L.), Carr.
NATURAL SIZE.



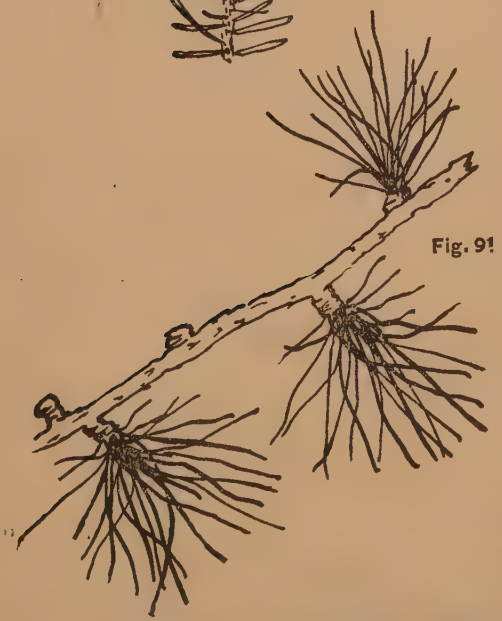


Fig. 90.—Balsam Fir. A. balsàmea (L.), Miller.
Fig. 91.—Larch. L, laricina (Du Roi), Koch.
NATURAL SIZE.

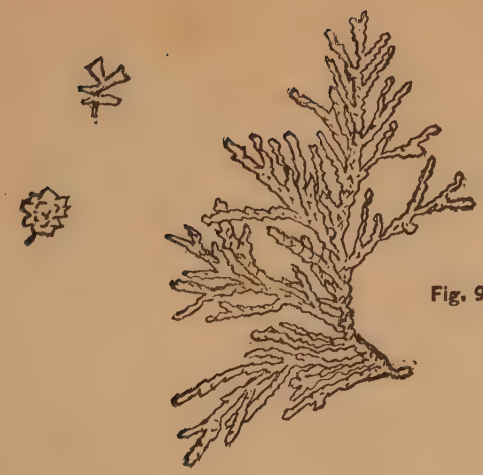


Fig. 92

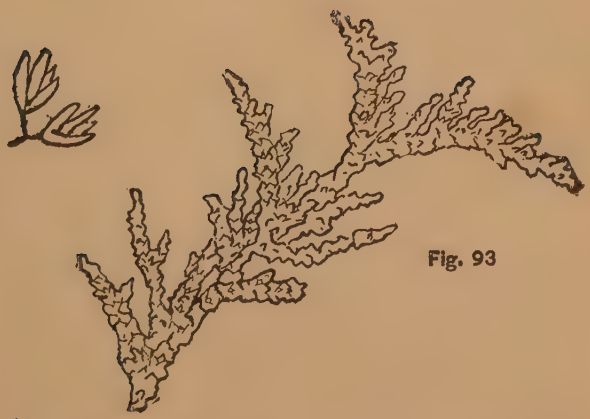


Fig. 93

Fig. 92.—White Cedar. C. thyoides (L.), B. S. P.
Fig. 93.—Arbor Vitæ. (T. occidentàlis, L.)
NATURAL SIZE.

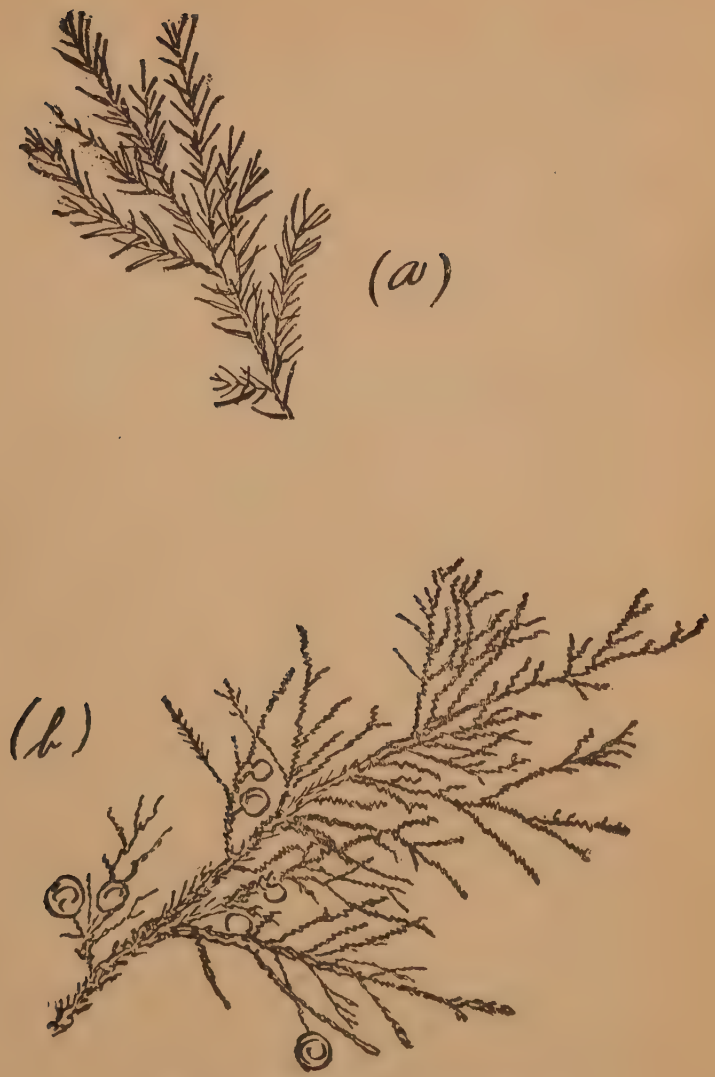


Fig. 94.—Red Cedar. (J. Virginiàna, L.)

a. Young. *b*. Old.

NATURAL SIZE.

REES WITH COMPOUND LEAVES

(FEATHER-SHAPED)

LEAVES ALTERNATE

(EDGE ENTIRE)

D I

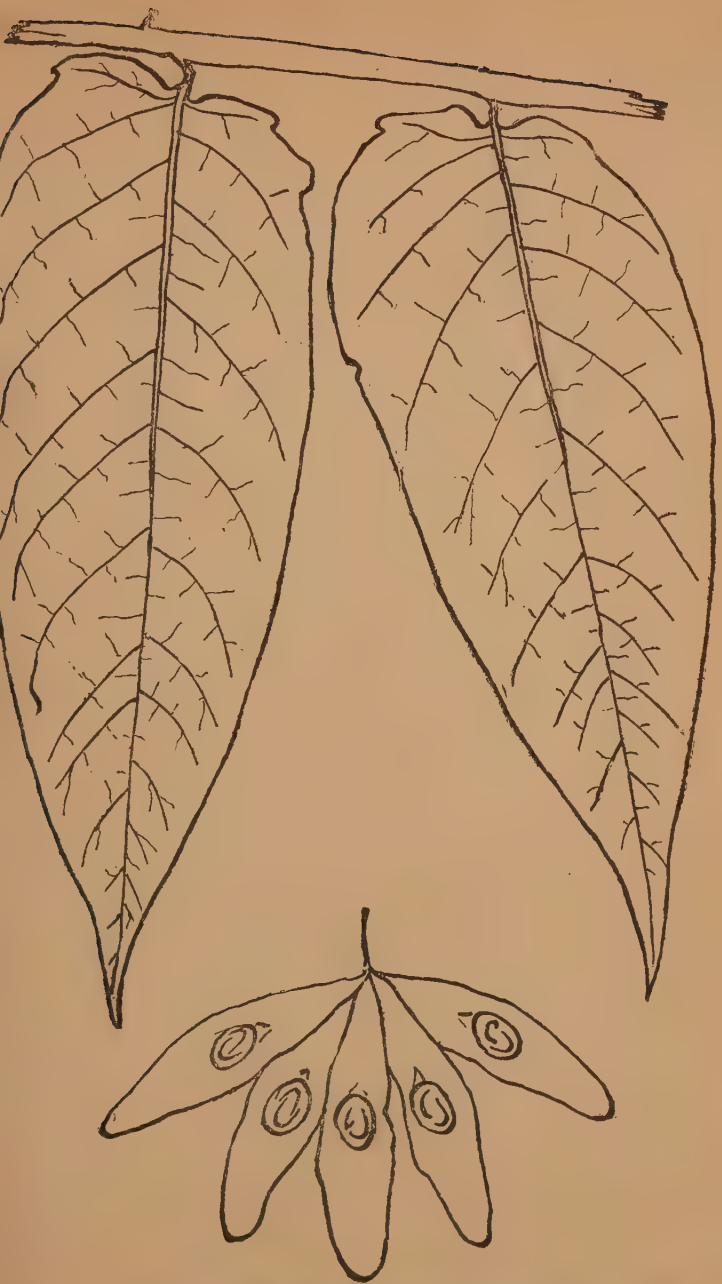


Fig. 95.—Ailànthus. [A. glandulòsa, Desf.]
NATURAL SIZE.

Fig. 96.—Locust. (R. pseudacàcia, L.)
NATURAL SIZE.

Fig. 97.—**Kentucky Coffee Tree.** G. dioicus (L.), Koch.
NATURAL SIZE.

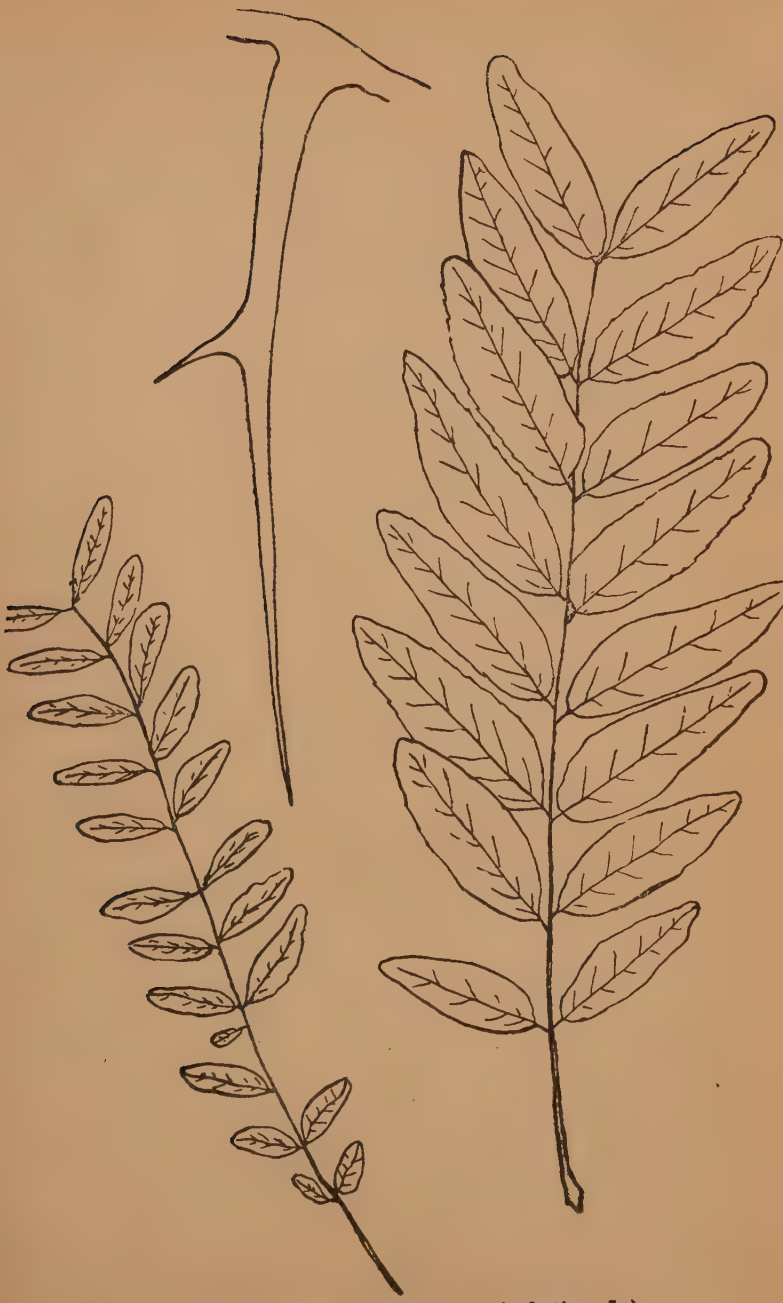


Fig. 98.—Honey Locust. (G. triacànthos, L.)
NATURAL SIZE.

TREES WITH COMPOUND LEAVES

(FEATHER-SHAPED)

LEAVES ALTERNATE

CONTINUED

(EDGE TOOTHED)

D II

Fig. 100.—Poison Sumach. (R. venenàta, D. C.)
NATURAL SIZE.

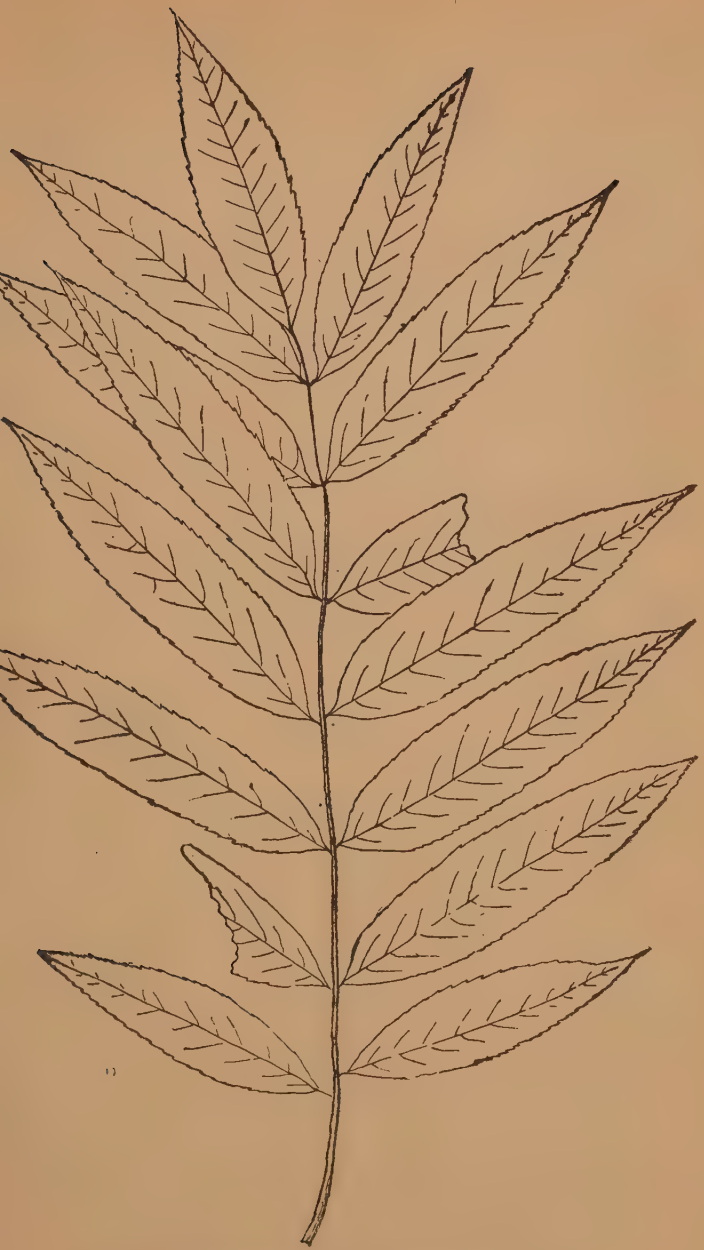


Fig. 101.—Mountain Ash. (P. Americàna, D. C.)
REDUCED ONE FOURTH.

Fig. 102

Fig. 103

Fig. 102.—Black Walnut. (J. nigra, L.)
Fig. 103.—Butternut. (J. cinèrea, L.)
LEAFLETS AND FRUIT REDUCED ONE THIRD.

Fig. 104.—Shag-bark. H. ovàta (Mill), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 105.—Mocker-nut. H. alba (L.), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 106.—Small-fruited Hickory. H. microcàrpa (Nutt), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 107, *a* and *b*.—Pig-nut. H. glabra (Mill), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 108.—Bitter-nut. H. minima (Marsh), Britton.
LEAF AND FRUIT REDUCED ONE THIRD.

TREES WITH COMPOUND LEAVES

(FEATHER-SHAPED)

CONTINUED

LEAVES OPPOSITE

(EDGE ENTIRE OR TOOTHED)

E I. II

Fig. 109.—Ash-leaved Maple. (N. acerŏides, M.)
NATURAL SIZE.

Fig. 110.—White Ash. (F. Americàna, L.)
LEAF AND FRUIT REDUCED ONE THIRD.

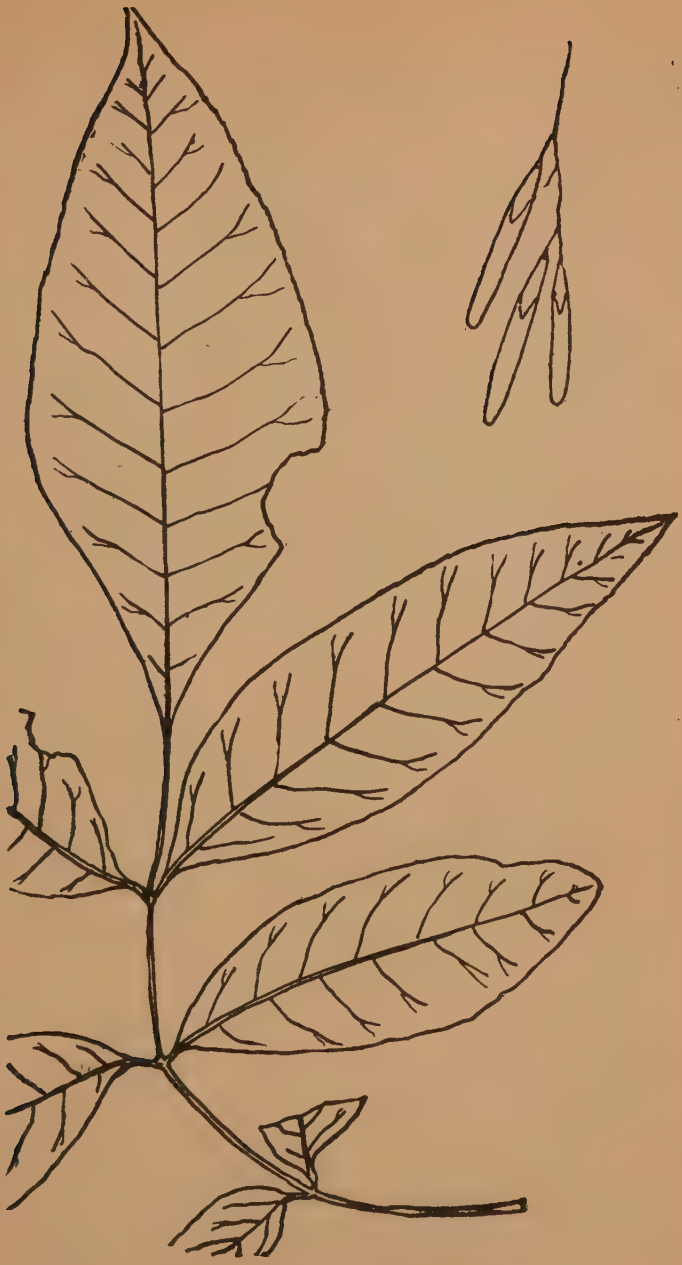


Fig. 111.—Red Ash. (F. pubèscens, Lam.)
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 112.—Green Ash. (F. viridis, Michx., f.)
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 113.—Blue Ash. (F. quadrangulàta, Michx.)
LEAF AND FRUIT REDUCED ONE THIRD.

Fig. 114.—Black Ash. (F. sambucifolia, Lam.)
LEAF AND FRUIT REDUCED ONE THIRD.

TREES WITH COMPOUND LEAVES

(HAND-SHAPED)

LEAVES OPPOSITE

(EDGE TOOTHED)

F I

Fig. 115.—Sweet Buckeye. (Æ. flava, Ait.)
REDUCED ONE THIRD.

Fig. 116.—Ohio Buckeye. (Æ. glabra, Willd.)
REDUCED ONE THIRD.

NAMES OF OMITTED AND COMPARATIVELY UNIMPORTANT TREES.

Tilia heterophýlla. Vent.
pubèscens. Ait.
Pyrus angustifòlia. Ait.
Crataègus coccìnea, L. var. mollis.
crus-galli, L. pyracanthifòlia.
Amelànchier Canadènsis, L. var. T. and G.
Ulmus racemòsa. Thomas.
Celtis occidentàlis, L. var. crassifòlia.
Salix amygdaloìdes. Anders.
Quercus macrocàrpa, Michx. var. olivæfòrmis.
Quercus coccìnea, Wang. var. ambìgua, Gray.
(Of nine hybrid oaks, most are outside our limits or entirely local.)
Catàlpa speciòsa. Ward.
Robìnia viscòsa. Vent.
Gleditschia triacànthos, L. var. inèrmis, and var. brachycàrpos.
Rhus týphina, L. var. laciniàta.
Pyrus sambucifòlia
Hicòria sulcàta (Willd). Britton.

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The names of genera are given in SMALL CAPITALS, of species and varieties in roman type. The names of introduced species are enclosed by brackets.

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